What is claimed is:

1. An apparatus for adjusting small-signal compensation in a switching regulator that includes an inductor and a switching circuit that is arranged to provide selective charging of the inductor, the apparatus comprising:

a measurement circuit that is arranged to provide a measurement signal (V_I) that in associated with operating conditions for the inductor;

a feedback circuit that is arranged to provide a feedback signal in response to an output signal that is associated with the switching regulator;

a control circuit that is arranged to provide a drive signal to the switching circuit to effect selective charging of the inductor, wherein the feedback circuit and the control circuit are arranged in a feedback loop of the switching regulator such that the switching regulator has a loop transfer function with a second-order pole and a zero, wherein a location associated with the zero is dynamically adjusted by at least one of the feedback circuit and the control circuit in response to the measurement signal to counteract the effect of the second-order pole on stability of the switching regulator.

2. The apparatus of claim 1, wherein a location associated with the second-order pole is determined by a value associated with the inductor, and wherein at least one of the feedback circuit and the control circuit are arranged to respond to changes in the value associated with the inductor to accommodate a range of values for the inductor.

3. The apparatus of claim 1, wherein the value associated with the inductor changes based on at least one of: on operating current associated with the inductor, an input voltage associated with the switching regulator, an output voltage associated with the switching regulator, and a load condition associated with the regulator, and wherein at least one of the feedback circuit and the control circuit are arranged to respond to the measurement signal such that the zero is dynamically adjusted in response to changes in the value associated with the inductor.

4. The apparatus of claim 1, further comprising: a resistor circuit and a capacitor circuit that are included in the feedback circuit, wherein the resistor circuit and a capacitor circuit that are arranged to provide a zero in the loop transfer function of the switching regulator, and wherein the feedback circuit is arranged such that a value associated with at least one of the resistor and the capacitor is adjusted in response to the measurement signal such that the location of the zero changes in response to the measurement signal.

5. The apparatus of claim 1, the feedback circuit comprising: a gain block, a function block and an adjustable resistor circuit, wherein the gain block is arranged to receive the measurement signal and provide a scaled measurement signal, the function block is arranged to provide a control signal that is responsive to the scaled measurement signal, and the adjustable resistor circuit has an associated resistance value that is responsive to changes in the control signal, wherein changes in the resistance value results in an associated change in the location of the zero.

6. The apparatus of claim 5, wherein the adjustable resistance circuit comprising: a transistor and a resistor, wherein the resistance circuit is coupled in parallel with the transistor circuit, and the transistor includes a control terminal that is responsive to the control signal such that the effective resistance associated with the adjustable resistance circuit is responsive to changes in the control signal.

7. The apparatus of claim 1, the control circuit comprising: an amplifier circuit, two capacitor circuits, a two resistor circuits, wherein: a first one of the resistor circuits is coupled in parallel with a first one of the capacitor circuits to form a first network, a second one of the resistor circuits is coupled in series to a second one of the capacitor circuits to form a second network, the first network is coupled between an input terminal and an input of the amplifier, and the second network is coupled between the input of the amplifier and an output of the amplifier.

8. The apparatus of claim 7, wherein at least one of the first resistor circuit and the second resistor circuit has an adjustable resistance value that is arranged to move the location of the zero in response to changes in the measurement signal.

9. The apparatus of claim 7, wherein the first resistor circuit and the second resistor circuit both have adjustable resistance values that are arranged to move the location of the zero in response to changes in the measurement signal.

10. The apparatus of claim 1, wherein the feedback circuit includes a zero adjustment circuit that comprises a controlled transconductance cell that is arranged to cooperate with a capacitor circuit to form a g_m-C type filter that has a time constant that is determined by C/g_m, wherein the time constant associated with the feedback circuit is responsive to changes in the measurement signal.

11. The apparatus of claim 10, wherein the controlled transconductance cell includes a control terminal that is responsive to a control current, and wherein the feedback circuit is arranged such that the control current is responsive to changes in the measurement signal.

12. The apparatus of claim 1, wherein at least one of the feedback circuit and the control circuit includes at least one zero adjustment circuit, wherein each of the zero adjustment circuits is configured to adjust the location of at least one zero in the loop transfer function in response to changes in the measurement signal.

13. The apparatus of claim 1, wherein the control circuit includes a zero adjustment circuit that comprises a controlled transconductance cell that is arranged to cooperate with a capacitor circuit to form a g_m-C type filter that has a time constant that is determined by C/g_m, wherein the time constant associated with the feedback circuit is responsive to changes in the measurement signal.

14. The apparatus of claim 1, wherein the control circuit corresponds to a PWM controller in the switching regulator, and the feedback circuit comprises a DSP block, wherein the DSP block is arranged to adjust the small-signal compensation of the switching regulator in response to changes in the measurement signal and the output signal from the switching regulator.

15. The apparatus of claim 14, wherein the measurement signal is related to a value associated with the inductor.

16. The apparatus of claim 1, wherein the feedback circuit and the control circuit are arranged in a common circuit.

17. The apparatus of claim 1, wherein the control circuit is arranged to cooperate with the inductor such that the switching regulator operates as at least one of: a buck regulator, a boost regulator, and a buck-boost regulator.

18. An apparatus for adjusting small-signal compensation in a switching regulator that includes an inductor and a switching circuit that is arranged to provide selective charging of the inductor, the apparatus comprising:

a measurement means that is arranged to provide a measurement signal (V_I) that in associated with operating conditions for the inductor;

a feedback means that is arranged to provide a feedback signal in response to an output signal that is associated with the switching regulator; and

a control means that is arranged to provide a drive signal to the switching circuit to effect selective charging of the inductor, wherein the feedback means and the control means are arranged in a feedback loop of the switching regulator such that the switching regulator has a loop transfer function with a second-order pole and at least one zero, wherein a location associated with at least one zero is dynamically adjusted by at least one of the feedback means and the control means in response to the measurement signal to counteract the effect of the second-order pole on stability of the switching regulator.

19. The apparatus of claim 18, wherein the feedback means and the control means are arranged in a common circuit.

20. The apparatus of claim 18, wherein the control means is arranged to cooperate with the inductor such that the switching regulator operates as at least one of: a buck regulator, a boost regulator, and a buck-boost regulator.

21. A method for adjusting small-signal compensation in a switching regulator that includes an inductor and a switch means, the method comprising:

measuring a parameter associated with the inductor;

monitoring an output signal that is associated with a feedback loop in the switching regulator; and

dynamically adjusting at least one zero in response to the measured parameter with a zero adjustment circuit, wherein each zero is associated with a closed-loop transfer function for the feedback loop in the switching regulator such that instabilities from a second-order pole in the loop transfer function is counteracted by the zero adjustment circuit.

22. The method of claim 21, wherein the measured parameter corresponds to a value associated with the inductor, and the zero adjustment circuit is arranged to dynamically adjust the small-signal compensation based on the measured value associated with the inductor.

23. The method of claim 21, wherein the zero adjustment circuit is implemented by at least one of a portion of a DSP block, and an analog function block.